MEDICAL DEVICE TRANSPORTATION UNIT

BACKGROUND ART

This invention comprises a medical device transportation unit for holding a variety of medical devices used by patients who suffer from illnesses or disorders that require them to travel with a medical device. One example of such a device is a continuous positive airway pressure machine, used to treat certain sleep disorders.

According to the American Academy of Sleep Medicine in Rochester, MN, at least 84 disorders of sleeping and waking cause a lower quality of life by reducing personal health. It is estimated that in the United States, 20 million people have obstructed sleep apnea, most commonly diagnosed as a sleep disorder. Obstructive Sleep Apnea (OSA) is the inability to breathe during normal sleep. A person's airway is held open by muscles controlling the tongue and soft palate. As the muscle relaxes, the airway becomes narrowed, and/or blocked, causing the individual to snore or gasp for air.

As a result of obstructive sleep apnea, many individuals may be awakened several times a night, causing severe sleep deprivation and daytime sleepiness. Untreated OSA may lead to serious health problems, including but not necessary limited to, high blood pressure, heart attack, stroke, road accidents, memory loss and sexual dysfunction. Other signs and/or symptoms include morning headaches or mood swings.

OSA is not limited to adults. Children may also be affected by this disorder. Children who struggle to breathe while snoring may be

suffering from OSA. Again, the child may snore or gasp and as they snore, the child starts and stops breathing.

Some of the commonalities of OSA for both adults and children include, sleeping with the head of the bed propped up with many pillows, snoring loudly and often, stopping breathing during the night for short periods of time, sweating heavily during the night, sleeping restlessly, difficulty waking up, even though he or she has had enough sleep, headaches during the day, specifically in the morning, irritability, crankiness and day dreaming in school or at work.

The only way to detect and/or determine OSA is for the specialist to record the individual's sleep for at least one night in a laboratory, with a test called polysomnography (PSG). By placing recording devices on the individual's head and body, this will monitor sleep patterns. Specialists will also monitor and record brain waves, leg and arm movements, muscle activity, heartbeat and breathing pattern.

Treatment options include surgery, nasal continuous positive airway pressure devices and life style changes. For children with enlarged tonsils, the doctor may recommend an Aden tonsillectomy, (removing of the tonsils) or uvuloplatopharyngoplasty, (uvula, tonsils and part of the soft palate are removed). A tracheotomy, (opening a hole in the wind pipe at the neck) is generally used only for life threatening situations.

Other treatments include CPAP (Continuous Positive Airway Pressure) and BiPAP (Bi-level) machine treatment, in which a small

mask is worn over the nose during sleep. The machine provides air pressure to the mask that keeps the throat from closing during sleep. This is very significant for both adults and children when surgical treatment is not possible or desirable, or when surgery does not cure the OSA. By preventing airway blockage and collapse, many of the symptoms associated with OSA are alleviated.

A serious concern for the individual is the transporting and/or storing of the CPAP/BiPAP machines; which must be used continuously by the individual in order to function daily. CPAP/BiPAP users complain about storage of the machines. In hotels, many times there are limited outlets. These outlets are often being used for the hotel's appliances such as lamps, and television sets. Another concern is where to place the equipment at night. The hoses of the machine can become tangled and/or kinked during sleep, which interferes with the airflow, disturbing one's sleep. Some users are concerned that friends and or relatives may see the machine. This is embarrassing to the user. When traveling on an airplane, the user must carry the machine in a shoulder bag, which is very heavy. In addition the machine can become damaged if thrown around in the storage compartment of the plane.

While OSA has been discussed in detail, other illnesses and medical conditions also require the use of a treatment machine, for instance, portable suction machines for the treatment of tracheotomy and paraplegic patients, portable oxygen tanks and equipment for lung diseases, nebulizer machines for quadriplegic and paraplegic patients or patients who continuously receive oxygen and humidifiers

for asthma patients. All of these machines and devices require the patient to transport them when traveling with the same problems described for the OSA machines.

DISCLOSURE OF INVENTION

This invention comprises a three compartment transportation unit for a medical device, the size of a carry-on piece of luggage, which has wheels so that it can easily be transported. The upper compartment, if used for a CPAP/BiPAP machine, is used for the breathing mask and hose. The center compartment holds the blower of the machine, which in use gets very hot, and the lower compartment holds the electrical components including for instance, an extension cord and a multi-plug adaptor. There is also sufficient room in the lower compartment to store some clothing or nightwear or other items.

The four sides of the transportation unit around the center compartment, which holds the machine or blower, are totally removable, to allow proper cooling of the blower.

The floor of both the upper compartment and the center compartment are grills, allowing the easy tying down of the blower, or other machine. There is also an opening in each of the grills for passage of any hoses or wires from one compartment to the other.

The transportation unit of this invention provides the solution to the transporting, protection, and storage of a medical device, such as a CPAP/BiPAP machine, which provides great convenience for the patient, user, as well as providing

storage that does not reveal the contents and the medical use of the machine, protecting the patient's privacy.

Accordingly, several objects and advantages of the invention are as follows:

It is an object of the present invention to provide a medical device transporting unit, adapted to transport a treatment machine and its attendant requirements.

Another object of the invention is to provide a medical device transporting unit which may be carried onto an airplane but holds the medical device securely and privately.

These, as well as other objects of the invention, will become obvious from the following description in which:

BRIEF DESCRIPTION OF DRAWINGS

Fig. 1 is a perspective view of the transporting unit;

Fig. 2 is an exploded perspective view;

Fig. 3 is an open perspective view;

Fig. 4 is an alternate embodiment;

Fig. 5 is another alternate embodiment showing the unit stored therein; and

Fig. 6 is the embodiment of Fig. 5 showing the unit empty.

BEST MODE FOR CARRYING OUT THE INVENTION

Referring now to the drawings there is shown in Figs. 1-3 the medical device transporting unit 10, having three separate compartments, upper compartment 12, center compartment 14, and lower compartment 16. Unit 10 has two feet 18 and 20 and two wheels 22 (not seen) and 24, so that it can stand securely in the

upright position and yet be rolled on wheels 22 and 24, by tilting unit 10 back and using retractable handle 26.

Upper compartment 12 is covered on all four sides by panels 28, 30 32, and 34. Side panels 28 and 32 have handles 36 and a similar handle on other side panel 32, for ease in carrying unit 10 when retractable handle 26 cannot be used. Back panel 30, as well as side panels 28 and 32 are fixedly attached and cannot be removed. Front panel 34 is totally removable, as shown in Fig. 2. Front panel 34 may be removably attached by any convenient means such as zippers, snaps or hook and loop fasteners.

Center compartment 14 is also covered on all four sides by side panel 38, back panel 40, opposite side panel 42, and front panel 44. All four panels of center compartment 14 are removable, for air cooling purposes, as explained in more detail below. The four panels of center compartment 14 are also removably attached by any convenient methods, such as zippers, snaps or hook and loop fasteners.

Lower compartment 16 has side panel 46, back panel 48, opposite side panel 50 and front panel 52. Side panel 46 has handle 54 to aid in carrying unit 10 when retractable handle 28 cannot be used. Panels 46, 48 and 50 are not removable, however front panel 52 is removable, in a similar manner to panels 34 and 44, to give access to lower compartment 16.

Unit 10 also has fixed top 56 and fixed bottom 58. Shelf 60, between upper compartment 12 and center compartment 14 is a grate, that is, a frame of parallel bars. Shelf 62 between

center compartment 14 and lower compartment 16 is also a grate. Shelf 60 has a cut-out opening 64 and shelf 62 has a similar cut-out opening 66, the purpose of which is explained below.

As shown in Fig. 2, a medical device 68 is carried in unit 10 by placing it on grated shelf 62 of center compartment 14. Medical device 68 is held securely on shelf 62 by any convenient tie-down means, such as elastic cords 70 and 72, which have hooks at each end to hook around a bar of grate shelf 62. This holds medical device 68 securely in place during transportation.

Depicted in the Fig. 2 is a CPAP machine 68, described above. It also comprises a hose 74 and a mask 76. By means of opening 64, hose 74 can remain attached to machine 68, pass through opening 64 and remain on shelf 60 during transportation, as well as during use. Hose 74 and mask 76 can also be tied down by any convenient means if desired, but do not necessarily have to be tied down.

Lower fixed shelf 58 is utilized to carry electrical cords and plugs 78 that are necessary for plugging machine 68 into a power outlet. Power cord 78 can remain attached to machine 68 by passing through opening 66 in center shelf 62. Lower compartment 16 is large enough for the user to also pack a few clothes or other items, as desired.

Fig. 4 shows the same unit configuration in which front panel 34 is removable on three sides but remains attached by a flexible hinge to top 56, so that in use, panel 34 can be folded over the top of top 56. All four panels 38, 40, 42 and 44, of center compartment 14, similarly remain attached by a flexible hinge and can be lowered against lower compartment 16 when the machine 68 is in use or when otherwise desired. Similarly, front panel 52 of lower compartment 16 remains attached at its lower end by a flexible hinge and can be lowered to rest against the ground during use. One advantage of this embodiment is that all the panels remain attached at least one edge, so that they cannot be lost.

All four panels of center compartment 14 need to be removed or lowered (Fig. 4) when the machine is in use, because machine 68 gets quite hot during use and needs as much air flow and exposure to the air as possible, to keep it cool. If a machine or other medical device which does not require cooling is being transported in unit 10, the panels of center compartment 14 do not all need to be removed, possibly only the front panel for access.

Fig. 5 discloses another embodiment of the invention. This embodiment comprises a medical device transporting unit 80 having three separate compartments. There is an upper compartment 82, a center compartment 84 and a lower compartment 86. A single front cover 88 is connected to the bottom edge 90 of lower compartment 86 by a flexible hinge 92. Cover 88 is shown in its open

position. When cover 88 is swung into its upward position, it completely covers the front of all three compartments 82, 84 and 86. Cover 88 may then be attached to the front of the transporting unit by any convenient means, preferably by a zipper or zippers although it may also be connected by other connectors such as snaps or hook and loop fasteners.

Cover 88 has three openings 94, 96 and 98. Each of these openings is covered by a flap 100, 102 and 104. Flaps 100, 102 and 104 may be closed by any convenient means such as a zipper, snaps or hook and loop fasteners. Flaps 100, 102 and 104 may be swung open in order to gain access to openings 94, 96 and 98 in order to get into each of the three compartments 82, 84 and 86 without unzipping the entire cover 88 from the front of the transporting unit 80. This provides an easy access to any of the three compartments when desired.

Two additional flaps 106 and 108 are provided at the sides of center compartment 84. This provides additional access to air for cooling motor or machine 110 which is contained in center compartment 84.

In this embodiment hose 112, which will be connected to the patient, is contained in upper compartment 82 and the electrical connection equipment 114 is contained in lower compartment 86.

In this embodiment shelves 116, 118 and 120 of each of the three compartments 82, 84 and 86 are solid, as opposed to the grates described in the first embodiment. There is an opening 122 cut through shelf 116 of upper compartment 82 large enough to

allow hose 112 to pass through from the upper compartment 82 to connect to machine 110 in center compartment 84. There is also an opening 124 in shelf 118 of center compartment 84 in order for electrical wires 114 to pass from machine 110 to electrical connectors 114.

Transportation unit 80 has an upper handle 126, which raises and lowers similar to many pieces of luggage. The transporting unit also may optionally have a locking mechanism 128 to lock cover 88 closed for security purposes.

Fig. 6 shows the medical device transportation unit 80 as shown in Fig. 5, with the machine and electrical removed, in order to more clearly see the compartments. Also seen are restraining belts 130 in upper compartment 82 and belts 132 in center compartment 84 for holding securely the hoses in the upper compartment and the machine or pump in the center compartment.

A pocket or pockets (not shown) may be added to the back side of the unit for holding papers or other items.

Medical device transportation unit 80 is similar to the unit shown in the first embodiment, in that it has wheels for easy transportation, common to carry-on luggage.

INDUSTRIAL APPLICABILITY

The units of this invention provide a safe, secure, convenient and private method of not only transporting a medical device, such as a CPAP machine, but also allows the patient to use the medical machine while it remains stored in the unit, providing convenience and privacy. While a CPAP/BiPAP machine

has been used in the description, examples of other medical devices that can be carried and transported by this unit include portable suction machines, portable oxygen tanks, nebulizer machines and humidifiers.

Having thus described the invention,

We claim: